

MW241 Small I/O module for LED lights control



Summary MW241 is a small I/O module featuring 2 DI and 2 DO (solid state relays). It is used for control of two lighting groups (using switches or buttons) or as a simple I/O module with no embedded bindings between inputs and outputs – the logical functionality is implemented in a master PLC.

Application

- Control of two lighting groups, with override from a PLC or SCADA over the bus
- Control of a blind
- I/O module 2×DI, 2×DO for general use

Function In a plastic casing suitable for mounting into a flush box there is a board with terminals, and other components. As the device is energized the outputs set into predefined states and then are controlled either by input signals, or by bus commands, or by combination of both. Priorities may be set: the outputs permanently copy the states of the inputs (local control), or change their states as input states change (the last command is valid), with optional override over the bus.

It is also possible to set the function of bus override: relays are updated either at each change of the bus command, or at each bus command, or permanently with no regards of bus commands frequency. See details in the Modbus map (domat-int.com/en/downloads/technical-documentation/modbus-tables).

The module communicates over RS485 as Modbus RTU slave.

Technical data	
Power	24 V AC/DC, ±20 %
Consumption	max. 2 W
Working temperature of the module	0 ÷ 70°C
Number of outputs (SSR)	2 (NO)

SSR load	230 V AC, max. 1 A, AC1, general use, non-inductive load according to EN 60947-4-1, galv. insulation 1,5 kV
Connection - SSR	Wires 1.5 mm ² , length 7 cm, stripped tinned ends 10 mm
Connection – other terminals	Screw terminals, for 0,14 – 1 mm ² wires
Contact lifespan	virtually unlimited
Inputs	for potential-free contacts, against G0
Initialization	short-circuit terminals INIT and G0
Communication	Modbus RTU / RS485, galvanically separated (1 kV), 1200...115200 bps
Dimensions	49 × 49 × 30 mm
Protection degree	IP20 (EN 60529)

The MW241 can be set to the communication INIT (Modbus address 1, 9600, N, 8) by short-circuiting of terminals INIT and G0 followed by a power cycle. To terminate the bus, please connect an external resistor (120 Ω) to terminals K1+ and K1-.

Harmonisation with standards

Environmental conditions:

- **external influences** according to EN 60721-3-3. Class 3K5 (-5 to +45 °C; 5 % to 95 % relative non-condensing humidity)
- **storage** according to EN 60721-3-1 Class 1K3 (-5 to +45 °C; 5 % to 95 % relative non-condensing humidity)

Standards conformance:

- EMC EN 61000-6-2 ed.3:2005, EN 55022 ed.3:2010 (industrial environment)
- electrical safety EN 60950-1 ed.2:2006 + A11:2009 + A12:2011 + A1:2010 + A2:2014 + Opr.1:2012
- limitation of hazardous substances EN 50581:2012

Czech legislative:

- Government regulation 118/2016, technical requirements on low-voltage devices
- Government regulation 117/2016, technical requirements on products regarding their electromagnetic compatibility
- Government regulation 481/2012, on limitation of certain hazardous substances in electrical and electronical devices

EU legislative:

- Council Directive 2014/35/EC, The Low Voltage Directive (LVD)
- Council Directive 2014/30/EC, Electromagnetic Compatibility (EMC) Directive
- Council Directive 2011/65/EC, RoHS2 Directive

Terminals

Screw terminals

G0	common ground
G	power
IN1	input A (referred to as Input 0 in the Modbus table)
IN2	input B (referred to as Input 1 in the Modbus table)
INIT	initialization terminal
K1+	RS485, +

K1- RS485, -

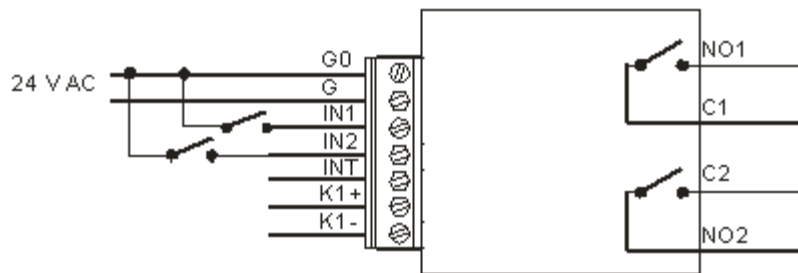
Outputs (wires)

NO1 output SSR relay A (referred to as Relay 0 in the Modbus table)
 C1 common relay A
 C2 common relay B
 NO2 output SSR relay B (referred to as Relay 1 in the Modbus table)

LED

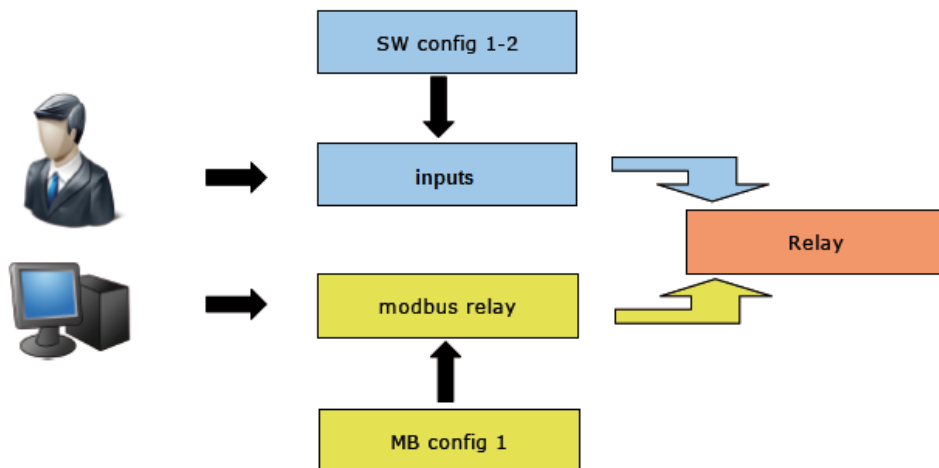
green power (on = power OK)
 red Tx RS485 (flashes = data transmit)

Connection



General function notes

The MW241 controls the outputs according to the states of inputs (pushbuttons or switches) and Modbus commands. Priorities and function regarding Modbus write events can be set using Modbus configuration registers, see tables below. The module can be configured for local control (switches / pushbuttons), bus control override, combined control („the last command is valid“), etc.



Inputs function settings

Edge

The output status is changed at an edge on the input. Rising or falling edge is selected.

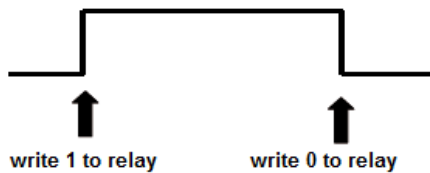
Register	Value
SW config 1	0x05
SW config 2	0x00



State change

The input state is copied to the output, the *Relay* register is written to only at a change of the input state.

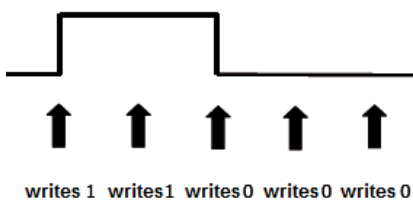
Register	Value
SW config 1	0x50
SW config 2	0x00



Copying of inputs

Periodically (as fast as the processor cycle allows) copies the input state to the output.

Register	Value
SW config 1	0x00
SW config 2	0x05



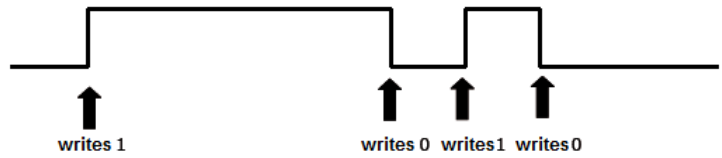
Writing from the bus

Modbus state

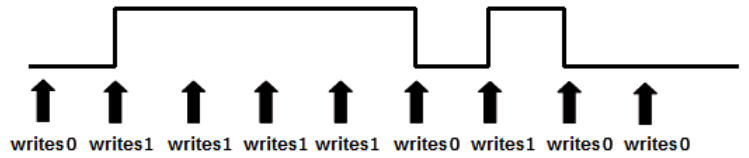
The *Modbus relay* values are periodically (as fast as the processor cycle allows) copied to the *Relay* register.

Register	Value
MB config 1	0x05

modbus relay



relay

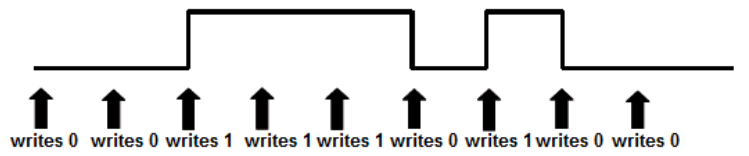


Modbus change

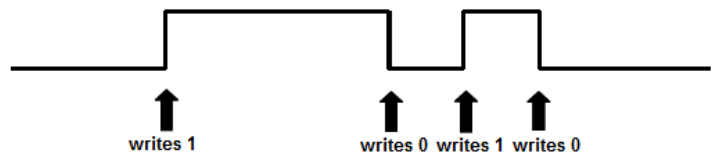
Each *Modbus relay* value change initiates copying of the new state into the *Relay* register.

Register	Value
MB config 1	0x0A

modbus relay



relay

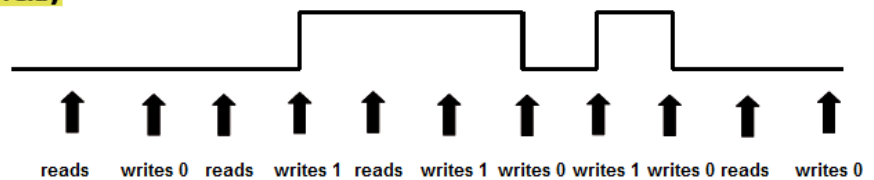


Modbus writing

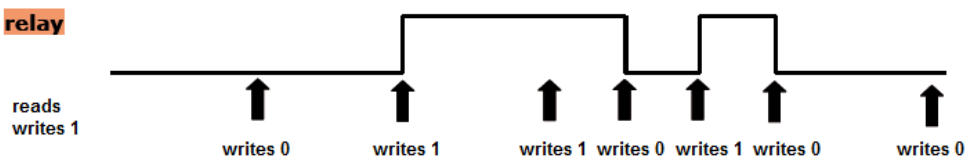
Each write event into the *Modbus relay* register initiates copying of the register value into the *Relay* register.

Register	Value
MB config 1	0x0F

modbus relay



relay



If the function **Copying of inputs** together with function **Modbus state** is selected, priority is set in the *SW/MB config 1* (6 LSB) register.

**Changes in
versions**

01/2017 – First version of the data sheet